Incorporation of Predictive Population Modeling into the AOP Framework: A Case Study with White Suckers Exposed to Pulp Effluent

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A need in ecological risk assessment is the ability to create linkages between chemically-induced alterations at molecular and biochemical levels of organization with adverse outcomes in whole organisms and populations. A predictive model was developed to translate changes in the fecundity of a breeding population of white sucker *(Catostomus commersoni)* collected in the field to alterations in population growth rate. Individual-level responses of fish exposed to pulp mill effluent at a study site in Jackfish Bay, Lake Superior, were used to demonstrate the model's capability to project alterations in population status. The Jackfish Bay study site also has monitoring data for biochemical endpoints of interest in the white sucker, including steroid measurements amenable to interpretation through different adverse outcome pathways (AOPs) for reproductive effects. Linkage of the population model to biochemical measurements relevant to adverse outcomes can facilitate extrapolation of data from the Jackfish Bay study site to other white sucker populations at sites that are less data rich. Application requires only a life table for the organism of interest, a measure of carrying capacity for the given population, and estimation of the effect of stressors on vital rates within the fish of the study population. This abstract does not necessarily reflect U.S. EPA Policy.